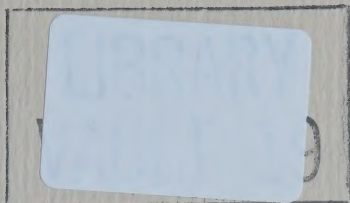


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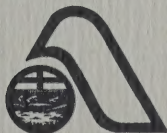


LETHBRIDGE — MEDICINE HAT DAIRY FARM BUSINESS SUMMARY

A REPORT
ON
7 SAMPLE DAIRY FARMS
1971



PRODUCTION ECONOMICS BRANCH
MARKET INTELLIGENCE SECTION
MARKETING DIVISION



ALBERTA DEPARTMENT OF AGRICULTURE

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7 SAMPLE DAIRY FARMS

K.D. Porter

PRODUCTION ECONOMICS BRANCH

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DEPARTMENT OF AGRICULTURE

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INTRODUCTION

In 1971, seven fluid milk producers in the Lethbridge - Medicine Hat milkshed provided their records of the year's business for analysis. This represented a 13% sample of the shippers in the two areas.

This report contains a summary and analysis of business activities on a group basis in conformation with previous reports. It is intended to supplement computer printouts in the hands of the dairymen with a general comparative analysis, and to provide information to the dairy industry, the Dairy Control Board and to government personnel in the field of farm management.

ACKNOWLEDGEMENTS

Acknowledgement is due to the participating dairymen for providing their records of business and for their very considerable efforts in assisting the fieldmen of the Production Economics Branch in this respect. Thanks are also due to the Dairy Control Board for their assistance, and to the Economic Stimulation Program of the Federal government which helped significantly in the process of gathering the information.

K.D. Porter, Head
Production Economics Branch

DEFINITION OF TERMS

Total Farm - This term includes all enterprises in farm business, and in this report it refers to the income and expenses associated with the total farm operation.

Operating Revenue - Includes cash receipts and the adjustment of crop and livestock inventories less livestock purchased.

Operating Expenses - Are cash expenses plus depreciation, plus an allowance for unpaid family labour exclusive of the operator.

Net Farm Income - Is the difference between Operating Revenue and Operating Expense prior to deducting Capital interest expense and an interest return up to a combined value of 7% of the current equity in the farm.

Labour Income - Is the residual to the operator after deducting the interest on investment.

Labour Earnings - Is the addition of labour income and the value of home-consumed produce, and is the amount forthcoming to the farm operator for his labour and management for the year.

Dairy Enterprise - The Dairy Enterprise, for the purpose of business analysis, is an operating unit in itself which may draw upon other enterprises of the farm for such resources as feed and labour.

Herd Credit - Is the increase or decrease in the value of the dairy herd through sales, purchases, births, natural growth and dairy livestock losses during the year.

Milk Costs Per Hundredweight - This refers to the analysis of costs of production of milk sold to the fluid milk distributing plants.

Return to Management and Profit - Or Return to the Operator's Management and Risk, is the dollar value remaining to the operator after including his labour and interest at 7% on capital as costs of operation.

Value of Production From Dairy - Is the receipts from the sale and personal use of dairy products plus the value of inventory change in feed and dairy cattle less purchase of dairy livestock.

DEFINITION OF TERMS

Total Variable Costs - Are short-term costs which vary relative to output.

Fixed Costs - Consist of depreciation, interest on investment and such costs as utilities, insurance and taxes.

Total Production Cost - Is the sum of all variable costs, labour and fixed costs.

Unpaid Labour - Consists of the operator's labour and any unpaid labour contributed by the family.

Capital Turnover - Is the number of years required for the value of production or operating revenue to equal the average investment for the year.

OUTLINE OF THE STUDY

The overall dairy study, of which Lethbridge - Medicine Hat is a part, deals with the economics of fluid milk production at the producer level in three general Alberta areas--Edmonton, Calgary and Lethbridge. In Alberta as a whole, an 8.1% sample of the 740 shippers submitted business information for the calendar year of 1971. The seven farms from Lethbridge - Medicine Hat represented a 13% sampling of shippers in that area. The average size of sample farm quotas was 1342 pounds. The average quota size in the area was 1704 pounds.

Objectives

The purpose of the study is to provide a continuing account of the economic conditions in the production of fluid milk in Alberta for the Dairy Control Board and the milk industry as a whole, and to provide the participating dairy farmers with personal business analyses for management purposes.

Characteristics of the Study

The study was designed to be as representative as possible through selection by area and by quota size, the dairy enterprise being the main source of income on all farms. Crop enterprises are carried on in nearly all the dairy farms and certain dairy farmers had beef enterprises which were also analysed when requested.

Report Procedure

The Lethbridge - Medicine Hat farms were assembled in terms of a single area. Basic tables on Income and Expense respecting the Total Farm and Dairy Enterprise were first constructed from computer output. Management levels were then determined, followed by auxiliary tables of feed and labour use. A further development of management factors and their effect on the total Alberta sample of dairy enterprises was added to point out the main factors contributing to success.

FARM INCOME AND EXPENSES

Table 1 presents comparative Income Statements in terms of group averages for 1970 and 1971. All farm business activities were included in the summary.

Receipts - Milk sales were the most important source of revenue on all farms. There were others of considerable significance. Gross milk sales increased by \$6,815.00 in 1971. The division of cash receipts in 1971 was 71% to Dairy, 24% to Other Livestock, 5% to Crops and 3% to Miscellaneous. Receipts were \$3,040.00 higher per farm than in 1970. No change occurred in the general pattern of farm production.

Inventory Change - The negative balances in each year are largely due to timing of livestock purchases, mostly relating to feeder cattle. This factor, however, was offset by the higher milk sales in 1971 and served to increase the operating revenue to \$71,589.00.

Expenses - Feed purchases change from year to year relative to crop yields and both summer and winter weather conditions. It still remained as the largest single item of expense in 1971. The other major items such as General Farm Expense, General Dairy Expense, Annual Joint Expense and Wages increased in 1971. The total effect was to raise the Operating Payments. An increase occurred in depreciation charges while the value of Family Labour decreased. Thus, the Net Farm Income of \$26,136.00 in 1971 was \$3,796.00 higher than that of the previous year.

Labour Earnings - In 1971 capital investment in buildings, livestock, quota and equipment appeared to have increased. This occurred partly through added investment in new facilities and new machinery and an increase in livestock and quota values. An average amount of \$3,354.00 was paid by farmers in cash on capital loans and is included in the Interest on Capital figure in the table. Upon deduction of the interest allowance and addition of the perquisites value, the 1971 Operator's Labour Earnings amounted to \$10,363.00.

Table 1

INCOME STATEMENT FOR THE TOTAL FARM OPERATION

January 1, 1971 to December 31, 1971

Lethbridge Whole Milk Farms	Group Average 1970	Group Average 1971	Your Farm	Group Average 1970	Group Average 1971	Your Farm
Number of farms ^{a/}	7	7		7	7	
<u>EXPENSES</u>	<u>b/</u>			<u>RECEIPTS</u>		
Feed bought for LS	\$ 9,898	\$ 9,668	\$	Gross milk sales	\$40,401	\$47,216
Auto expenses	614	486		Dairy cattle sales	7,281	7,038
Tractor expenses	1,663	1,174		Other livestock	19,806	17,808
Truck expenses	1,047	1,302		Crop sales	5,175	3,273
Gen. farm exp. (seed, fert., twine, etc.)	5,830	7,156		Misc. receipts	1,255	1,623
Gen. dairy exp. (vet., milkhous. supp., etc.)	2,530	3,246		TOTAL CASH RECEIPTS	73,918	76,958
Annual joint exp. (ins., phone, taxes, elec.)	2,292	3,755		Change in Crop Inventory	1,902	767
Wages paid with board	6,738	8,864		Change in LS Inventory	-693	5,477
Hauling & fees off milk cheque	2,183	2,621		Deduct: LS Purchases	13,125	11,613
OPERATING PAYMENTS	32,795	38,272		Net Inventory Change	-11,916	-5,369
Add:				OPERATING REVENUE	62,002	71,589
Depreciation on bldgs. and equipment	5,808	6,282				
Unpaid family labour (not incl. operator)	1,059	899				
TOTAL OPERATING EXPENSES	39,662	45,453				
Net Farm Income	22,340	26,136				

The Net Farm Income for the groups of farms above represents the Average Net Income per farm. The Net Farm Income is modified by deducting interest on the operator's equity at a rate of 7% and also interest which was paid on farm indebtedness. Long term liabilities were not completely available in 1970, thus now necessitating an adjustment in the amount of interest assessed in the previous year in order to achieve comparability with 1971 figures. The final measure is known as the operator's LABOUR EARNINGS which is the return to the operator for his labour and management and is shown below.

Deduct:			
Int. on capital	\$15,057	\$16,430	\$
LABOUR INCOME	7,283	9,706	
Add: Perquisites	105	657	
LABOUR EARNINGS ^{c/}	\$ 7,388	\$10,363	\$

^{a/} Previous year's figures included for comparison.

^{b/} All figures have been rounded to the nearest dollar.

^{c/} Labour Earnings, 1970, Revised.

LETHBRIDGE DAIRY ENTERPRISE ANALYSIS

Table 2 deals with the dairy enterprise on the farms. It contains comparative summaries of receipts and expenses for Lethbridge dairy farms on a group average basis during 1970 and 1971.^{1/} Receipts include all income from dairy products and livestock. In cases where dairy steers are normally raised for sale, this was considered as a beef enterprise and was excluded from dairy analysis. Expenses were assembled under the major headings of Feed, Labour, Overhead and Other Costs. The Labour costs include the value of the operator's labour, so that a residual return to management above all costs can be derived.

Average receipts of \$58,653.00 per farm in 1971 were \$12,245.00 higher than in 1970 due to increased milk sales and a high herd credit.

Costs also rose in 1971. They were composed of Feed - 42%, Labour - 20%, Overhead - 18% and Other Costs - 20%. These combined cost factors contributed to an increase of \$11,843.00 over 1970. However, in 1971 Total Receipts exceeded Total Costs by \$9,998.00, an increase of \$402.00 in the return to management above that of the previous year.

Milk Costs Per Hundredweight

In this section of the table, receipts other than those arising from the sale of milk to whole milk plants were eliminated and costs were reduced by the amount of the herd credit in order to arrive at a net return per hundredweight of sales to plants.

Feed cost per hundredweight rose by \$0.23. The other costs also increased resulting in a gross cost of \$5.48 per hundredweight. This was \$0.55 above the gross cost of 1970. However, the higher value of herd credit reduced the net cost of milk production to \$4.20 per hundredweight. This cost when deducted from the higher average price resulted in a return to the operator's management and risk of \$1.22 per hundredweight--\$0.02 above the 1970 figure.

^{1/} Consolidation of Edmonton, Calgary and Lethbridge--page 15.

Table 2

DAIRY ENTERPRISE COST ANALYSIS

January 1, 1971 to December 31, 1971

	Group Average 1970	Group Average 1971	Your Farm
<u>Lethbridge Whole Milk Farms</u>			
Number of farms	7	7	
<u>Dairy Receipts Per Farm</u>			
Value of milk sales per farm	\$40,401	\$47,103	\$
Value of milk used in house per farm	168	217	
Value of credits to dairy herd per farm ^{a/}	5,839	11,221	
Value of miscellaneous dairy income		112	
Total Receipts	46,408	58,653	
<u>Dairy Costs Per Farm</u>			
Feed cost at farm market value (including pasture)	15,433	20,506	
Labour cost ^{b/}	7,157	9,438	
Overhead cost (depreciation and interest)	7,349	9,313	
Other costs (marketing, milkhouse supplies, etc.)	6,873	9,398	
Total Costs	36,812	48,655	
Net amount left for profit and management after charging custom rate per hour for dairy labour	9,596	9,998	
<u>Milk Costs Per Hundredweight Basis</u>			
Feed (including all purchased and home grown and pasture charge)	2.07	2.30	
Labour (dairy share of total farm labour)	0.96	1.08	
Overhead cost (depreciation and interest)	0.98	1.03	
Other costs (marketing, milkhouse supplies, etc.)	0.92	1.07	
Total gross cost per cwt. milk	4.93	5.48	
Credit from herd increase (due to herd growth)	0.78	1.28	
Total net costs per cwt. milk	4.15	4.20	
Average price received per cwt. for all milk sold	5.35	5.42	
Returns to management and profit per cwt. of milk	1.20	1.22	
Net cost per lb. butterfat	1.19	1.24	
Receipts per lb. butterfat	1.53	1.60	
Butterfat test of milk	3.49%	3.40%	

^{a/} Credits to dairy herd are value of herd at the end of the year plus sales of cattle, plus cattle butchered, less value of herd at the beginning of the year and less purchase of cattle. They also include milk fed to calves. For a further explanation of Herd Credit, see Appendix page 3.

^{b/} Represents wages paid for single and married dairy labour. Where no hired help was employed, operator and family labour was entered at the average rate for hired labour.

MANAGEMENT

Management is concerned with organizing, planning, directing and supervising a business. Dairy farmers carry out these functions and, in many cases, add their own labour. Over the long term, their decisions are made in reference to two conditions--size and intensity. The wide range in size of Alberta dairy herds has persisted for many years. This has not been so much due to entry of small operators as to the decision of existing operators as to how big a business they wish to manage. Under such diverse conditions, it would be most difficult to select any one farm as a model for all operations.

Table 3 has been set up to show average levels in the management factors influencing income in 1970 and 1971. The unit factors, per cow, per D.A.U., per hour, per pound and per hundredweight, which measure intensity, are perhaps of the greatest direct interest in individual comparisons for small and intermediate operators and are given prominence in this table.

Livestock - Productivity levels in 1971 were up in terms of milk and butterfat. Roughage consumption per D.A.U. rose considerably in 1971. Gross returns per \$100 of feed fed were lower than in 1970.

Crops - The yields of barley, oats and roughage were up from 1970.

Labour - Man equivalents and Operating Revenue refer to the total farm. An increase occurred in both in 1971. The cost of dairy labour per hour rose \$0.10 and the returns to labour per hour decreased slightly. Efficiency in time per hundredweight of milk produced remained at the approximate 1970 level.

Capital - This relates to the total farm business and shows a higher revenue per \$1,000 of capital and a small improvement in turnover of capital invested.

Size of Business - Average farm size in 1971 decreased due to sample change. Total utilized capital rose \$14,468.00. The size of the producing herd increased by 7.1 cows.

Table 3

MANAGEMENT FACTORS AFFECTING INCOME

January 1, 1971 to December 31, 1971

Lethbridge Whole Milk Farms		Group Average 1970	Group Average 1971	Your Farm
Number of farms		7	7	
<u>Livestock</u>				
Milk production per cow (including milk fed to calves and for home use)		(lbs.)	11,519	12,232
Fluid milk sales per farm		(lbs.)	743,875	868,641
Butterfat per cow		(lbs.)	402	416
Butterfat test of milk		(%)	3.49	3.40
Grain & supplement fed per dairy animal unit		(lbs.)	3,384	4,195
Roughage per dairy animal unit		(tons)	4.0	5.8
Gross returns per \$100 feed fed		(\$)	301	291
<u>Crops</u>				
Yield per acre:	Barley	(bus.)	56	62
	Oats	(bus.)	62	86
	Wheat	(bus.)	24	42
	Roughage	(tons)	3.4	3.5
	Other (Sugar Beets)	(tons)	14.7	10.0
<u>Labour</u>				
Man equivalent per farm		(no.)	2.70	2.91
Operating revenue per man		(\$)	22,939	24,553
Cost of dairy labour per man hour ^{a/}		(\$)	1.60	1.70
Net returns to dairy management & labour/man hour		(\$)	3.74	3.63
Labour per pound of butterfat produced		(hrs.)	0.17	0.18
Hours of labour per 100 pounds of milk produced		(hrs.)	0.58	0.61
Hours per cow equivalent (total herd)		(hrs.)	48	60
<u>Capital</u>				
Operating revenue per \$1,000 of utilized capital		(\$)	279	300
Years for operating revenue to equal utilized capital		(yrs.)	3.6	3.3
<u>Size of Business</u>				
Number of acres owned and rented		(acs.)	1,178	627
Number of acres owned		(acs.)	1,130	570
Number of cultivated acres (including summerfallow)		(acs.)	495	397
Owned capital investment		(\$)	215,102	228,176
Rented capital investment		(\$)	8,836	10,230
Number of milk cows (including dry cows)		(no.)	67.5	74.6
Total dairy animal units ^{b/}		(no.)	92.7	92.7
Number of milk cows as percent of total herd in cow equivalent		(%)	73.0	80.4

^{a/} The average rate for all labour charged to dairy chores. This consisted of single and married wages with board. The operator's labour was charged at the going married labour rate.

^{b/} In terms of cow equivalent, i.e. one cow equals 1.5 heifers or 3 calves.

FEED CONSUMPTION AND FEED VALUES

Purchased roughage in 1971 consisted mostly of alfalfa in this irrigation area. Four out of the seven farms bought hay. Home grown roughage included a considerable amount of native hay and cereal silage which supplemented the main roughage diet of alfalfa. The comparative prices below show that the price level in 1971 was lower than in 1970. Consumption of feed was higher per farm and per dairy animal unit.

In 1971, about 41% of all grain and concentrates was bought. The complete feed mix amounted to approximately 66% in these transactions. The average purchase price per pound was higher than in 1970. Home grown grain was fed in the proportion of three of oats to one of barley by weight. Farmers estimated the value of their own grain on the average at a price of 1.66 cents per pound. The proportions in the types of roughage fed were alfalfa - 58%, silage - 18%, greenfeed - 8% and native hay and feed straw - 16%. The proportions in the feeding of grain and concentrates were wheat - 1%, oats - 25%, barley - 44% and complete or prepared feeds - 30%.

Table 4 DAIRY LIVESTOCK FEED CONSUMPTION AND FEED VALUES

		Group Average 1970	Group Average 1971
<u>Lethbridge Whole Milk Farms</u>			
Number of farms		7	7
<u>Purchased Roughage Fed</u>			
Average value per farm	(\$)	2,259	1,248
Average tons per farm	(tons)	99.0	53.4
Value per ton	(\$)	24.36	23.36
<u>Home Grown Roughage Fed</u>			
Average value per farm	(\$)	5,953	9,302
Average tons per farm	(tons)	303.6	450.8
Value per ton	(\$)	19.61	20.63
<u>Purchased Grain, Complete Feed, Etc. Fed</u>			
Average value per farm	(\$)	4,169	4,267
Average pounds per farm	(lbs.)	234,457	160,371
Value per pound	(¢)	1.78	2.66
<u>Home Grown Grains Fed</u>			
Average value per farm	(\$)	1,905	3,840
Average pounds per farm	(lbs.)	79,268	230,876
Value per pound	(¢)	2.41	1.66

LABOUR

Among the seven dairy farms on study in the Lethbridge - Medicine Hat area in 1971, 59% of the total labour used was hired. Most of this labour could be considered skilled in the all-around requirements of a dairy farm, though much of it applied exclusively to the dairy enterprise on the farm. Father-son or brother partnerships were represented as well as single proprietor operations. Full-time partners usually received a stated wage. Where no such arrangement existed, the operator was asked to indicate the going wage as his partner's labour wage.

For the purpose of attributing a value to all labour on the farm, the farm operators were asked to value their labour at going rates. This was undertaken in order to show its significance in the analysis where returns were attributed to the operator's labour as well as to his equity and his management of the business. In the Lethbridge study, the operator's labour contributions are shown below. Though unpaid family labour did not receive formal wages, it was significant in the labour picture. It was evaluated with respect to age and the time involved. The summary is included.

A distribution of labour in the Lethbridge group of seven farms shows the type of labour and wages paid, including board, which was recorded in 1971. These wages represent payment for work of all kinds which occurred on the farm.

LABOUR RATES

	Hired Skilled Labour	Operator Labour	Unpaid Family Labour	Total Labour
Months	142	84	19	245
Total Value	\$62,044	\$36,720	\$6,293	\$105,014
Value Per Month	\$436	\$437	\$333	\$429

RETURN TO UNPAID LABOUR, MANAGEMENT AND INVESTMENT
(61 Alberta Dairy Enterprises)

The total Alberta sample of 61 farms was assembled in Table 5 to compare the level of returns between two major groups. The basis of comparison was the return for the combined items of unpaid labour, management and investment arising out of the dairy enterprise. These components are highly variable between farms, and when the returns to Management is specified as the single outcome, the importance of the other two items is sometimes overlooked.

In Table 5, the return to unpaid labour, management and investment for all farms averaged \$283.00 per cow. The enterprises were arranged in two groups--above and below that level. Thirty-two were above, twenty-nine were below. The accompanying table shows general similarities and some significant differences in the costs and returns for the two groups.

The table shows both groups chosen on this basis as being fairly close to equal size, in the range of \$29,000.00 to \$32,000.00 Value of Production, 550,000 pounds of milk production, 50 milking cows and \$70,000 of investment in the Dairy Operation. However, differences in costs are apparent, and a glance at the per hundredweight costs in the first column will show how these lower costs contributed to the better overall financial returns accompanying them.

Comparisons with the second column of figures will show that every item of expense is lower in the first group. Differences in costs appear in feed - \$0.41, other variable expenses - \$0.30, labour - \$0.12, fixed costs - \$0.15, giving a total cost reduction of \$0.98 per hundredweight.

Considering the relatively large number of farms in each group and the nearly equal size of business, it would appear that these per unit comparisons are good indicators of the expenses dairymen might want to watch. While feed has the greatest bearing on costs, the table shows that each of the items must be given attention by the operator if he wishes to achieve the largest returns from the dairy enterprise. Though lower feed costs accounted for the greatest single reduction in cost, the table indicates that each of the five played an important part in contributing to higher average returns per hundredweight for the first group.

Table 5

RESOURCE COSTS RELATED TO RETURNS TO
UNPAID LABOUR, MANAGEMENT AND INVESTMENT
(61 Alberta Dairy Enterprises)

		Return to Unpaid Labour, Management & Investment Per Cow	
		<u>Over \$283</u>	<u>Under \$283</u>
Number of Farms		32	29
Milk Sales	(\$)	32,107	29,567
Total Value of Production	(\$)	40,919	35,140
Total Cost of Production	(\$)	31,775	34,186
Return to Unpaid Labour, Mgmt. & Invest.	(\$)	18,355	9,711
Return to Management & Risk	(\$)	9,144	954
Receipts Per Cwt. Milk Produced	(\$)	7.01	6.62
Feed Cost Per Cwt.	(\$)	1.94	2.35
Other Variables Per Cwt.	(\$)	0.85	1.15
Labour Per Cwt.	(\$)	1.18	1.30
Fixed Cost Per Cwt.	(\$)	1.48	1.63
Total Production Costs	(\$)	5.45	6.43
Returns to:			
Unpaid Labour, Mgmt. & Invest. Per Cwt.	(\$)	3.14	1.83
Unpaid Labour & Management Per Cwt.	(\$)	2.26	0.92
Operator's Labour & Management Per Cwt.	(\$)	2.14	0.78
Management & Risk Per Cwt.	(\$)	1.56	0.19
Number of Milk Cows	(no.)	50.5	50.1
Total Milk Production	(lbs.)	583,588	531,195
Production Per Cow	(lbs.)	11,560	10,610
Total Investment	(\$)	73,673	69,890
Capital Turnover	(yrs.)	1.80	1.99

FACTOR EFFICIENCY AND RESOURCE USE
(61 Alberta Dairy Enterprises)

On page 7 there were a number of management factors listed which represent averages in the levels of resource use and output on the sample dairy farms in 1971. Each of the participating dairymen in his report will have his comparable figures beside them to which he may relate his own performance. There are ranges above and below average performance, however, that should be given analysis. This has been done by grouping the farms relative to chosen management factors such as those on the following page. The dairy enterprises from all sample farms in Edmonton, Calgary and Lethbridge - Medicine Hat were included in the accompanying analysis.

1. Size may be distinguished physically or financially in respect to either inputs or outputs. Size has been found to have a bearing on success. A large efficient farm may be expected to produce a larger net revenue than a small efficient farm. In regard to a dairy enterprise, the number of cows is a good index of size.

2. Output per cow is a measure of efficiency of herd productivity which should influence the profitability of the enterprise.

3. Sales of milk per \$1,000 of dairy investment shows how well capital is being used and also should be related positively to returns to the operator.

4. Milk production per man equivalent is a measure of labour efficiency.

5. Gross returns over feed fed per cow is a measure of efficiency in the use of feed and normally ought to cause an increase in net returns as the margin increases.

The measurements above are called Efficiency Factors. There are others, but these five are good indicators of success. They have been selected for use in this study.

First, the average levels of performance in the factors was found for the total group of 61 dairy enterprises. The individual enterprises were then divided into above average and below average in reference to the factors. Farms with performance levels which were exactly average were placed alternately in above and below average classifications.

The average factor levels were:

1. The number of cows in the herd 50.3 (cows)
2. Sales of milk per cow 10,791 (lbs.)
3. Sales of milk per \$1,000 of dairy investment . . . 429 (\$)
4. Milk produced per man equivalent 412,066 (lbs.)
5. Gross returns over feed cost per cow 523 (\$)

Table 6

FIVE-FACTOR EFFICIENCY OUTCOMES
(61 Alberta Dairy Enterprises)

Efficiency Factors	Number of Factors Above Average					
	0	1	2	3	4	5
Number of Enterprises	8	16	13	10	8	6
Number of Cows	35	40	40	46	77	90
Milk Sales Per Cow ^{1/} (lbs.)	7,849	9,691	10,025	10,980	12,034	12,800
Milk Sales Per \$1000 Investment ^{1/} (\$)	344	388	411	450	440	508
Milk Produced Per Man Equivalent (lbs.)	238,369	321,769	398,780	449,549	523,951	621,304
Gross Returns Over Feed Cost Per Cow (\$)	377	451	467	559	582	649

^{1/} To fluid milk plants.

Table 6 shows the number of factors above average over each of the five columns, with the highest degree of efficiency related to 5. The number of records associated with each follows, and the factor data is arranged below.

Inspection of the table reveals a clear trend in efficiency in all the items of productivity as one reads from left to right. There were eight instances in the zero class, and six in the class above average in all five factors. The largest group of sixteen enterprises was above average in one factor. The table shows that high performance in one aspect of production is not enough and that such performance should be attempted for all factors, in as far as possible, in order to make the best use of resources.

The factor analysis was carried a step further to ascertain that success in an increasing number of factors was, in fact, accompanied by higher net returns.

Table 7 below relates returns to factor performance.

Table 7

FACTOR EFFICIENCY AND RETURNS
TO THE OPERATOR
(61 Alberta Dairy Enterprises)

<u>Number of Efficiency Factors Above Average</u>	<u>Number of Enterprises</u>	<u>Returns to Unpaid Labour & Management</u>	<u>Operator's Labour Earnings</u>	<u>Returns to Operator's Mgm't & Risk</u>
5	6	\$22,647	\$22,320	\$19,463
4	8	\$13,432	\$13,209	\$10,340
3	10	\$11,045	\$10,666	\$ 7,163
2	13	\$ 7,069	\$ 6,499	\$ 3,398
1	16	\$ 5,357	\$ 4,250	\$ 648
0	8	\$ 3,836	\$ 2,493	-\$ 675

Three stages in returns to the operator were calculated for the 61 dairy enterprises and are set up in the columns as they occurred relative to the five factor performance. The number of factors above average range from high to low in the table with the corresponding returns on the same line.

Returns to Unpaid Labour and Management is the net return to the operator and unpaid family labour, Labour Earnings is the return to the operator's labour and management. Returns to the Operator's Management and Risk is the net to the operator after charging his own labour as a cost of operation.

It can be seen that returns in each column range from high to low, corresponding with the standing in efficiency factors. Thus, in regard to the dairy enterprises forming the study, the operators who were above average in an increasing number of efficiency factors achieved increasingly higher net returns from their businesses.

Table 8

REGIONAL ENTERPRISE COST COMPARISONS

	Edmonton Group Average 1971	Calgary Group Average 1971	Lethbridge Group Average 1971	All Areas Group Average 1971
Number of farms	36	18	7	61
<u>Dairy Receipts Per Farm</u>				
Value of milk sales	\$24,505	\$37,388	\$47,103	\$30,900
Value of milk used in house	87	144	217	119
Value of credits to dairy herd	5,060	8,487	11,221	6,778
Value of miscellaneous dairy income	452	322	112	375
Total Receipts	\$30,104	\$46,341	\$58,653	\$38,172
<u>Dairy Costs Per Farm</u>				
Feed cost at farm market value (including pasture)	\$ 8,948	\$14,348	\$20,506	\$11,868
Labour cost	5,939	7,739	9,438	6,872
Overhead cost (depreciation & interest)	5,954	10,248	9,313	7,607
Other costs	4,804	9,019	9,398	6,575
Total Costs	\$25,645	\$41,354	\$48,655	\$32,922
Return to Management	4,459	4,987	9,998	5,250
<u>Milk Costs Per Hundredweight Basis</u>				
Feed (purchased, home grown and pasture charge)	\$ 2.07	\$ 2.23	\$ 2.30	\$ 2.17
Labour (dairy share)	1.37	1.20	1.08	1.26
Overhead cost (depreciation & interest)	1.37	1.59	1.03	1.39
Other costs	1.11	1.40	1.07	1.21
Total gross cost per cwt. milk	\$ 5.92	\$ 6.42	\$ 5.48	\$ 6.03
Less credit from herd growth	1.17	1.32	1.28	1.24
Total net costs per cwt. milk	\$ 4.75	\$ 5.10	\$ 4.20	\$ 4.79
Average price received per cwt. for all milk sold	\$ 5.68	\$ 5.85	\$ 5.42	\$ 5.69
Return to management	0.93	0.75	1.22	0.90
Net cost per lb. butterfat	\$ 1.38	\$ 1.46	\$ 1.24	\$ 1.39
Receipts per lb. butterfat	1.65	1.67	1.60	1.65
Butterfat test of milk	3.45%	3.50%	3.40%	3.45%

The table above reproduces the Lethbridge Dairy Enterprise Cost Analysis from page 5, along with the corresponding tables from the Edmonton and Calgary reports. A consolidation of these which include all study farms is shown in the right-hand column.

APPENDIX

Table 1 CHARACTERISTICS OF 61 ALBERTA DAIRY ENTERPRISES
CLASSIFIED BY FEED COSTS PER COW & INVESTMENT PER COW

1971

		Cost of Feed ^{1/} Per Cow		Investment ^{2/} Per Cow	
		Over \$236	Under \$236	Over \$1,429	Under \$1,429
Number of Farms		29	32	32	29
1. Milk Sales	(\$)	37,581	24,845	31,029	30,757
2. Total Value of Production	(\$)	46,986	30,183	38,396	37,924
3. Total Cost of Production	(\$)	40,664	25,904	33,339	32,460
4. Return to Op. Labour & Mgmt.	(\$)	9,660	8,194	8,254	8,777
5. Return to Management & Risk	(\$)	6,322	4,279	5,057	5,464
6. Receipts/Cwt. Milk Produced	(\$)	6.83	6.84	6.89	6.77
7. Feed Cost Per Cwt.	(\$)	2.33	1.83	2.18	2.07
8. Other Variables Per Cwt.	(\$)	1.00	0.96	0.96	1.00
9. Labour Per Cwt.	(\$)	(.64 hr) 1.12	(.85 hr) 1.38	(.71 hr) 1.20	(.75 hr) 1.26
10. Fixed Cost Per Cwt.	(\$)	1.45	1.68	1.63	1.46
11. Total Production Costs	(\$)	5.90	5.87	5.97	5.79
Returns to:					
12. Unpaid Labour, Mgmt. & Invest.	(\$)	2.39	2.78	2.60	3.04
13. Unpaid Labour & Management	(\$)	1.50	1.86	1.61	1.70
14. Operator's Labour & Mgmt.	(\$)	1.40	1.69	1.48	1.57
15. Management & Risk	(\$)	0.93	0.97	0.91	0.97
16. Number of Cows	(\$)	57.5	43.7	47.1	53.8
17. Total Milk Production	(lbs.)	687,872	441,599	557,564	559,910
18. Production Per Cow	(lbs.)	11,957	10,101	11,832	10,412
19. Dairy Investment	(\$)	86,714	58,426	78,820	64,211
20. Capital Turnover	(yrs.)	1.85	1.94	2.05	1.69

^{1/} Feed cost per cow, above or below the average of \$236.00, is the main determinant in the results listed in columns 1 and 2.

^{2/} Dairy investment, above or below the average of \$1,429.00 per cow, is the controlling factor in the results obtained in the third and fourth columns.

Table 2 CHARACTERISTICS OF 61 ALBERTA DAIRY ENTERPRISES
CLASSIFIED BY THE GROSS VALUE OF PRODUCTION PER COW &
THE NUMBER OF HOURS OF LABOUR PER HUNDREDWEIGHT OF MILK

1971

Number of Farms		Gross Value ^{1/} of Production Per Cow		Hours of Labour ^{2/}	
		Over \$759	Under \$759	Over .73 Hrs./Cwt.	Under .73 Hrs./Cwt.
		26	35	39	22
1. Milk Sales	(\$)	41,269	23,196	22,333	46,086
2. Total Value of Production	(\$)	52,240	27,720	27,089	57,816
3. Total Cost of Production	(\$)	42,655	25,690	25,296	46,438
4. Return to Op. Labour & Mgmt.	(\$)	12,884	5,249	5,240	14,286
5. Return to Management & Risk	(\$)	9,585	2,031	1,793	11,378
6. Receipts/Cwt. Milk Produced	(\$)	7.03	6.58	6.76	6.90
7. Feed Cost Per Cwt.	(\$)	2.09	2.16	2.07	2.17
8. Other Variables Per Cwt.	(\$)	0.99	0.99	1.02	0.95
9. Labour Per Cwt.	(\$)	(.64hr) 1.13	(.84hr) 1.36	(.95 hr) 1.53	(.54hr) 0.98
10. Fixed Cost Per Cwt.	(\$)	1.52	1.59	1.68	1.43
11. Total Production Costs	(\$)	5.73	6.10	6.30	5.53
Returns to:					
12. Unpaid Labour, Mgmt. & Invest.	(\$)	2.66	2.41	2.49	2.60
13. Unpaid Labour & Management	(\$)	1.79	1.47	1.55	1.74
14. Operator's Labour & Management	(\$)	1.74	1.25	1.31	1.71
15. Management & Risk	(\$)	1.29	0.48	0.45	1.36
16. Number of cows	(no.)	61.1	42.3	39.5	69.5
17. Total Milk Production	(lbs.)	743,432	421,435	400,933	838,321
18. Production Per Cow	(lbs.)	12,172	9,970	10,161	12,066
19. Dairy Investment	(\$)	92,418	56,613	53,989	103,580
20. Capital Turnover	(yrs.)	1.77	2.04	1.99	1.79

^{1/} Productivity per cow, above or below the average of \$759.00, is the major factor identified with items in the first two columns.

^{2/} The labour time, above or below the average of .73 hours per hundredweight, is the controlling factor in the items in the third and fourth columns.

Herd Credit

Items that tended to increase Herd Credit in 1971 were sales of dairy cattle, transfers of dairy cattle to a beef herd, cattle slaughtered for home use or market purposes, an increase in herd value through growth, and a rising market price.

Items that tended to decrease Herd Credit in 1971 were transfers of beef heifers into the milking herd, purchases of dairy cattle, and a decrease in herd value through mortality.

Inventory increases in the sample dairy herds in 1971 constituted 34% of the Herd Credit in Edmonton, 57% in Calgary, 23% in Lethbridge - Medicine Hat and 41% in the sample group as a whole. Records from the respective areas showed these relationships.

	<u>Edmonton</u>		<u>Calgary</u>		<u>Lethbridge</u>		<u>All Areas</u>	
	\$	%	\$	%	\$	%	\$	%
<u>Inventory Increase</u>	1742		4863		2564		2757	
<u>Herd Credit</u>	5060	(34)	8487	(57)	11221	(23)	6778	(41)

Table 3
1971 CATTLE SALES & PURCHASES
(61 Dairy Farms)

<u>PURCHASES</u>				<u>SALES</u>			
	<u>No.</u>	<u>Value</u>	<u>Av. Value</u>		<u>No.</u>	<u>Value</u>	<u>Av. Value</u>
		\$	\$			\$	\$
<u>Edmonton</u>							
Milk Cows	38	14,911	392	Cows	338	87,346	258
Mature Heifers	44	12,317	280	Calves	549	34,422	63
<u>Calgary</u>							
Milk Cows	99	51,837	524	Cows	251	69,354	276
Mature Heifers	65	14,600	225	Calves	360	29,360	82
<u>Lethbridge</u>							
Milk Cows	13	5,250	404	Cows	118	28,984	246
Mature Heifers	---			Calves	148	13,133	89
<u>Alberta</u>							
Milk Cows	150	71,998	480	Cows	706	185,684	263
Mature Heifers	109	26,917	247	Calves	1057	76,915	73

